SEQUENCE LISTING

<110> Kawakami, Akira
Terami, Fumihiro

<120> LOW TEMPERATURE EXPRESSION CHITINASE cDNAs AND METHOD FOR ISOLATING THE SAME

<130> 107156-00004
<140> US 09/534,229

<141> 2000-03-24

<160> 8

<170> PatentIn version 3.0

<210> 1
<211> 256
<212> PRT
<213> Triticum aestivum

<400> 1

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Ala Val Ala Ala Gly Gly Ala Ala Ala Gln Gly Val Gly Ser Val Ile
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Thr Arg Ser Val Tyr Ala Ser Met Leu Pro Asn Arg Asp Asn Ser Leu
35 40 45

Cys Pro Ala Arg Gly Phe Tyr Thr Tyr Asp Ala Phe Ile Ala Ala Ala
50 55 60

Asn Thr Phe Pro Gly Phe Gly Thr Thr Gly Ser Ala Asp Asp Ile Lys
65 70 75 80

Arg Asp Leu Ala Ala Phe Phe Gly Gln Thr Ser His Glu Thr Thr Gly
85 90 95

Gly Thr Arg Gly Ala Ala Asp Gln Phe Gln Trp Gly Tyr Cys Phe Lys
100 105 110

Glu Glu Ile Ser Lys Ala Thr Ser Pro Pro Tyr Tyr Gly Arg Gly Pro
115 120 125

Ile Gln Leu Thr Gly Arg Ser Asn Tyr Asp Leu Ala Gly Arg Ala Ile
130 135 140

Gly Lys Asp Leu Val Ser Asn Pro Asp Leu Val Ser Thr Asp Ala Val
145 150 155 160

Val Ser Phe Arg Thr Ala Met Trp Phe Trp Met Thr Ala Gln Gly Asn
165 170 175

Lys Pro Ser Cys His Asn Val Ala Leu Arg Arg Trp Thr Pro Thr Ala
180 185 190

Ala Asp Thr Ala Ala Gly Arg Val Pro Gly Tyr Gly Val Ile Thr Asn
195 200 205

Ile Ile Asn Gly Gly Leu Glu Cys Gly Met Gly Arg Asn Asp Ala Asn
210 215 220

Val Asp Arg Ile Gly Tyr Tyr Thr Arg Tyr Cys Gly Met Leu Gly Thr
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Ala Thr Gly Gly Asn Leu Asp Cys Tyr Thr Gln Arg Asn Phe Ala Ser
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Leu Ala Ala Ala Ala Val Thr Pro Ala Thr Ala Glu Gln Cys Gly Ser
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Gln Ala Gly Gly Ala Lys Cys Ala Asp Cys Leu Cys Cys Ser Gln Phe
35 40 45

Gly Phe Cys Gly Thr Thr Ser Asp Tyr Cys Gly Pro Arg Cys Gln Ser
50 55 60

Gln Cys Thr Gly Cys Gly Gly Gly Gly Gly Gly Val Ala Ser Ile Val
65 70 75 80

Ser Arg Asp Leu Phe Glu Arg Phe Leu Leu His Arg Asn Asp Ala Ala
85 90 95

Cys Leu Ala Arg Gly Phe Tyr Thr Tyr Asp Ala Phe Leu Ala Ala Ala
100 105 110

Gly Ala Phe Pro Ala Phe Gly Thr Thr Gly Asp Leu Asp Thr Arg Lys
115 120 125

Arg Glu Val Ala Ala Phe Phe Gly Gln Thr Ser His Glu Thr Thr Gly
130 135 140

Gly Trp Pro Thr Ala Pro Asp Gly Pro Phe Ser Trp Gly Tyr Cys Phe
145 150 155 160

Lys Gln Glu Gln Gly Ser Pro Pro Ser Tyr Cys Asp Gln Ser Ala Asp
165 170 175

Trp Pro Cys Ala Pro Gly Lys Gln Tyr Tyr Gly Arg Gly Pro Ile Gln
180 185 190

Leu Thr His Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Val
195 200 205

Asp Leu Leu Asn Asn Pro Asp Leu Val Ala Thr Asp Pro Thr Val Ala
210 215 220

Phe Lys Thr Ala Ile Trp Phe Trp Met Thr Thr Gln Ser Asn Lys Pro
225 230 235 240

Ser Cys His Asp Val Ile Thr Gly Leu Trp Thr Pro Thr Ala Arg Asp
245 250 255

Ser Ala Ala Gly Arg Val Pro Gly Tyr Gly Val Ile Thr Asn Val Ile
260 265 270

Asn Gly Gly Ile Glu Cys Gly Met Gly Gln Asn Asp Lys Val Ala Asp
275 280 285

Arg Ile Gly Phe Tyr Lys Arg Tyr Cys Asp Ile Phe Gly Ile Gly Tyr
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Gly Asn Asn Leu Asp Cys Tyr Asn Gln Leu Ser Phe Asn Val Gly Leu
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Ala Ala Gln

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Ser Ala His Ala Glu Gln Cys Gly Ser Gln Ala Gly Gly Ala Thr Cys
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Pro Asn Cys Leu Cys Cys Ser Lys Phe Gly Phe Cys Gly Thr Thr Ser
35 40 45

Asp Tyr Cys Gly Thr Gly Cys Gln Ser Gln Cys Asn Gly Cys Ser Gly
50 55 60

Gly Thr Pro Val Pro Val Pro Thr Pro Ser Gly Gly Gly Val Ser Ser
65 70 75 80

Ile Ile Ser Gln Ser Leu Phe Asp Gln Met Leu Leu His Arg Asn Asp
85 90 95

Ala Ala Cys Leu Ala Lys Gly Phe Tyr Asn Tyr Gly Ala Phe Val Ala
100 105 110

Ala Ala Asn Ser Phe Ser Gly Phe Ala Thr Thr Gly Ser Thr Asp Val
115 120 125

Lys Lys Arg Glu Val Ala Ala Phe Leu Ala Gln Thr Ser His Glu Thr
130 135 140

Thr Gly Gly Trp Pro Thr Ala Pro Asp Gly Pro Tyr Ser Trp Gly Tyr
145 150 155 160

Cys Phe Asn Gln Glu Arg Gly Ala Thr Ser Asp Tyr Cys Thr Pro Ser
165 170 175

Ser Gln Trp Pro Cys Ala Pro Gly Lys Lys Tyr Phe Gly Arg Gly Pro
180 185 190

Ile Gln Ile Ser His Asn Tyr Asn Tyr Gly Pro Ala Gly Gln Ala Ile
195 200 205

Gly Thr Asp Leu Leu Asn Asn Pro Asp Leu Val Ala Ser Asp Ala Thr
210 215 220

Val Ser Phe Lys Thr Ala Leu Trp Phe Trp Met Thr Pro Gln Ser Pro
225 230 235 240

Lys Pro Ser Ser His Asp Val Ile Thr Gly Arg Trp Ser Pro Ser Gly
245 250 255

Ala Asp Gln Ala Ala Gly Arg Val Pro Gly Tyr Gly Val Ile Thr Asn
260 265 270

Ile Ile Asn Gly Gly Leu Glu Cys Gly Arg Gly Gln Asp Gly Arg Val
275 280 285

Ala Asp Arg Ile Gly Phe Tyr Lys Arg Tyr Cys Asp Leu Leu Gly Val
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Ser Tyr Gly Asp Asn Leu Asp Cys Tyr Asn Gln Arg Pro Phe Ala
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<212> DNA
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<223> Artificial primer.

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<223> n can be one of a,c,t, or g

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<211> 771
<212> DNA
<213> Triticum aestivum

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ctgcccaacc gcgacaactc gctgtgcccg gccagagggt tctacacgta cgacgccttc 180

atcgccgccg ccaacacctt cccgggcttc ggcaccaccg gcagcgccga cgacatcaag 240

cgcgacctcg ccgccttctt cggccagacc tcccacgaga ccaccggagg gacgagaggc 300

gctgccgacc agttccagtg gggctactgc ttcaaggaag agataagcaa ggccacgtcc 360

ccaccatact atggacgggg acccatccaa ttgacagggc ggtccaacta cgatcttgcc 420

gggagagcga tcgggaagga cctggtgagc aacccagacc tagtgtccac ggacgcggtg 480

gtgtccttca ggacggccat gtggttctgg atgacggcgc agggaaacaa gccgtcgtgc 540

cacaacgtcg ccctacgccg ctggacgccg acggccgccg acaccgctgc cggcagggta 600

cccggatacg gagtgatcac caatatcatc aacggcgggc tcgagtgcgg aatgggccgg 660

aacgacgcca acgtcgaccg catcggctac tacacgcgct actgcggcat gctcggcacg 720

gccaccggag gcaacctcga ctgctacacc cagaggaact tcgctagcta g 771

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<212> DNA
<213> Triticum aestivum

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<223> cDNA

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gactgcctgt gctgcagcca gttcgggttc tgcggcacca cctccgacta ctgcggcccc 180

cgctgccaga gccagtgcac tggctgcggt ggcggcggcg gcggggtggc ctccatcgtg 240

tccagggacc tcttcgagcg gttcctgctc catcgcaacg acgcagcgtg cctggcccgc 300

gggttctaca cgtacgacgc cttcttggcc gccgccggcg cgttcccggc cttcggcacc 360

accggagacc tggacacgcg gaagcgggag gtggcggcct tcttcggcca gacctctcac 420

gagaccaccg gcgggtggcc caccgcgccc gacggcccct tctcatgggg ctactgcttc 480

aagcaggagc agggctcgcc gccgagctac tgcgaccaga gcgccgactg gccgtgcgca 540

cccggcaagc agtactatgg ccgcggcccc atccagctca cccacaacta caactacgga 600

ccggcgggcc gcgcaatcgg ggtggacctg ctgaacaatc cggacctggt ggccacggac 660

ccgacagtgg cgttcaagac ggcgatatgg ttctggatga cgacgcagtc caacaagccg 720

tcgtgccatg acgtgatcac ggggctgtgg actccgacgg ccagggatag cgcagccgga 780

cgggtacccg ggtatggtgt catcaccaac gtcatcaacg gcgggatcca atgcggcatg 840

gggcagaacg acaaggtggc ggatcggatc gggttctaca agcgctattg tgacattttc 900

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gcggcacagt ga 972

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<222> (1)..(960)
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ttcggtttct gcggcaccac ctccgactac tgcggcaccg gctgccagag ccagtgcaat 180

ggctgcagcg gcggcacccc ggtaccggta ccgacccccc ccggcggcgg cgtctcctcc 240

attatctcgc agtcgctctt cgaccagatg ctgctgcacc gcaacgacgc ggcgtgcctg 300

gccaaggggt tctacaacta cggcgccttc gtcgccgccg ccaactcgtt ctcgggcttc 360

gcgaccacag gtagcaccga cgtcaagaag cgcgaggtgg ccgcgttcct cgctcagact 420

tcccacgaga cgaccggcgg gtggccgacg gcgcccgacg gcccctactc ctggggctac 480

tgcttcaacc aggagcgcgg cgccacctcc gactactgca cgccgagctc gcagtggcca 540

tgtgcgccgg gcaagaagta cttcgggcgc gggcccatcc agatctcaca caactacaac 600

tacgggccgg cggggcaggc catcggcacc gacctgctca acaacccgga ccttgtggcg 660

tcggacgcga ccgtgtcgtt taagacggcg ttgtggttct ggatgacgcc gcaatcaccc 720

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